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RESEARCH PAPER

Motives and Incentives for Joining Forest Owner Associations in Estonia

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Abstract The development of private ownership is an important outcome of structural changes for the whole economy as well as for the forestry sector in Estonia. Cooperation between forest owners has been seen as one possibility for increasing the provision of various forest-related benefits and goods. Yet the extent of cooperation between forest owners is still not at a sufficient level, but the reasons have not been extensively studied. The authors' aim was to find out the key determinants for forest owners to join a forest owner association and to explore how cooperation between owners could be increased. Survey data were used to divide the respondents into two groups according to whether they were members of forest owners associations or not. It was found that one key aspect is the size of the forest property—association members usually manage larger forest areas than non-members. In addition, the members tend to be more active and consistent in forest management activities than non-members. Also there is potential towards cooperation within non-members as their plans for the future are much more targeted. Although there are limits to voluntary cooperation, a huge potential for Estonian private forest owners could be realised by diversifying forest owner association activities and services to meet the different expectations of forest owners.

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Introduction

As in many Central and Eastern European countries, the forest sector in Estonia has significantly changed during the past two decades due to privatization and restitution. The area of forest land in private ownership and the number of non-industrial private forest (NIPF) owners have been increasing in Estonia and the process is still largely ongoing due to the continuing privatization of forest land. At the same time, economic conditions for wood producers have become more difficult. In Europe, particularly in Germany, the state is very much redefining its role within the forest sector and is attempting to reduce it as underlined by Schlüter (2007) and Schlüter and Koch (2011). These types of processes can be seen also in Estonia in the form of increased expectations of the state towards private initiative and cooperation. The National Forest Programme (NFP) to 2010 (2002) dealt mainly with advisory services and subsidies to forest owners. Cooperation was not separately highlighted in the document. Yet, the NFP 2011–2020 (2010) tackles cooperation as one of the most important issues in the private forestry sector.

Cooperation between, and joint action by, NIPF owners, especially when private forest ownership is fragmented, is the key to increasing production of certain public forest goods and reducing some negative externalities (Mendes et al. 2011). Indeed, fragmentation and lack of planning in forestry have been identified as key problems for the future (Yearbook of Forests 2009, 2010). Therefore, more active forest management is seen to be significant from the national perspective but also voluntary participation in joint actions suggests that it is also locally important (for forest owners and rural areas). Ialnazov and Nenovsky (2011) found that countries vary according to the strength of cooperation among their economic actors and that the degree of their cooperation is partly related to the achievements of the country. These characteristics of economic actors, regardless of whether they are rational and personal interest seeking "economic men" or environmental-economic balance seeking "ecological men" as described by Ingebrigtsen and Jakobsen (2009), are also applicable to forest owners since they possess certain resources irrespective of whether these resources are marketable or not. Cooperation in private forestry could be seen as an important tool to enhance the provision of both marketable and non-marketable goods. As an example, for several years the harvesting rate has been relatively modest especially in private forests. This has led to a shortage in the national wood supply in Estonia and it seems that cooperation is seen as a solution to overcome this. Consequently forest owners associations (FOAs) are seen as a tool for implementing state policies as also outlined by Schraml (2005): "their central role remains in the implementation of forest political concepts".

In Estonia FOAs started to develop in the beginning of the 1990s yet according to the NFP 2011–2020 (2010:26) only 6 % of forest owners are currently engaged in FOAs. But this small number of FOA members (∼4,500) account for roughly ¼ of the total area of private forest, i.e. ∼270,000 ha (calculations from Erametsakeskus

2011). The development of FOAs has been influenced by structural changes in the public sector. In the past, a variety of services (e.g. advice) was given to forest owners by state officials and only during the recent decade has the importance of FOAs risen. The Forest Act (Metsaseadus 2006) defines FOAs as non-profit or commercial associations (cooperatives) whose main activity, according to the statutes, is forest management and whose members are natural persons or private legal entities who own forest. Currently there are 47 regional FOAs in Estonia and they are providing the following services to private owners (Eramets 2011):

- Organizing forest owners with mutual interests within an area;
- Providing advisory services;
- Collective action, organization of events (meetings, field trips, contests);
- Communicating information to forest owners, organizing information sessions;
- Providing assistance to forest owners when applying for support and grants (both state and rural development funds);
- Protection of interests at local level (hunting laws, environmental restrictions, etc.);
- Joint economic activity (e.g. organizing joint sales and other cooperation in forest management activities).

One of the aims of the NFP 2011–2020 is that 500,000 ha of private forests would be in the ownership of FOA members (NFP 2010) by 2020, yet there seems to be a gap between what policy makers and forest owners want. It is not clear why some forest owners have joined FOAs and others have not. Therefore the authors aim to identify some key differences between these forest owners.

Private Forests and Forest Owners in Estonia

Forests cover 2.2 million ha (50.6 % of the total land area) in Estonia and private ownership accounts for 45.3 %, yet forest land undergoing privatization still accounts for 14.8 % of forest area (Keskkonnateabe Keskus 2012). In 2011 there were 93,271 private individuals and 4,001 enterprises and organisations who owned respectively 747,000 ha (74 %) and 263,000 ha (26 %) of private forest land in Estonia (Forinfo 2011). The average size of private forests is 10.4 ha, i.e. in the case of private persons (individuals) the average size is 8.0 ha, for private legal owners (e.g. companies, entrepreneurs) it is 65.7 ha (Forinfo 2011). Approximately 56 % of NIPF owners own properties with a size of 0.1–5.0 ha (76 % with a size of 0.1–10.0 ha) yet such forests account for only 14 % of the area of private forests (excluding legal owners). Forest owners who own 20 ha or more cover 42 % of private forests yet they make up only 9 % of forest owners.

Theoretical Framework

In line with the overview provided in the previous paragraph the authors aim to understand and describe forest owners' behaviour towards FOAs in Estonia. Although policy goals have been set on a national level, there is limited knowledge

about the possible motives of forest owners for joining FOAs. Therefore the aim of this paper is to provide the first insight into the topic in the Estonian case and specifically to determine:

- How do FOA members differ from non-members and whether these differences, if any, explain why the decision to become an FOA member is made?
- Whether these differences correspond to the existing relevant theories and concepts and what might be the key steps that need to be taken to reach the ambitious policy goals that have been set?

The amount of literature about cooperative activities and incentives to join organizations is considerable particularly for former Soviet countries that have been in the transition situation (Glück et al. 2010; Lazdinis et al. 2005; Malovrh et al. 2010; Milijic et al. 2010; Nonic et al. 2011) but also for countries with a long history of private ownership (Berlin et al. 2006; Darses et al. 2011; Finley et al. 2006; Kittredge 2003, 2005; Lutze 2010; Rauch 2007; Rickenbach et al. 2006; Vokun et al. 2010). The available literature reveals that in many former Soviet countries the average private forest area is relatively small and the importance of forest size (fragmentation) is often outlined. This fragmentation leads to inefficient management due to higher transaction costs and it limits access to markets (Schlueter 2008). It could be argued that very small forest owners are not interested in joining FOAs and it is more in the interest of larger forest owners. Within the theory of collective action outlined by Olson (1971), in addition to the importance of group size, the size of individual holding is highlighted—it is argued that the owners of larger forest areas will benefit more from possible lobbying actions than the owners with smaller areas. Yet, the reverse is also possible—an owner of a larger forest area is more independent and might not need any services from an FOA, whereas smaller forest owners are more dependent on these services. This indicates that the possible incentives to join FOAs are very diverse depending on several aspects which reflect the objectives or needs of the forest owner.

Karppinen (1998) argues that forest owners' decisions in general are based on situational (market condition) and institutional aspects (legislation), but among the most important factors are also long term objectives and values, because they form general guidelines for the behaviour of forest owners. Through interest associations, it is possible to influence policy-making and therefore direct the institutional environment towards a more favourable status. The importance of a *voice in policy making* is also outlined by Rickenbach et al. (2006). There is also the well-known *free riding* problem—those who are not members will benefit from the favourable institutional environment without contributing to achieve that situation. Based on the rationale of Olson (1971) it can be argued that if owners of large forest areas join a FOA, they do so as they are more interested in the need to influence the institutional environment and the smaller owners are mostly the *free riders*. In the case of subsidies, for example infrastructure improvement (forest roads and drainage), a larger forest owner will benefit more if the FOA lobbying results in having a support scheme. In the case of situational aspects (e.g. markets), cooperation can minimize transaction costs which, in turn, leads to more market power or improved access to markets. For example, Schlüter (2007) argues that in

the case of competition as a determinant of institutional change, the choice among several alternatives is made considering minimized transaction costs. The outcome of the change (e.g. becoming a FOA member) would be the most efficient management solution from all the possible alternatives. As an illustrative example, Schlüter (2007) points out the possibility to increase timber supply in an efficient manner from fragmented private forests through a forest association. So, in the case of smaller forest owners, the decision to join an FOA might be driven more by the situational aspects (market) than the institutional ones. With this rationale two important problems arise. Firstly, in this case it is assumed that even the small forest owners are interested in having more market power, i.e. financial returns from forestry matter. This, as briefly outlined by Ní Dhubháin et al. (2007), is indeed not always the case—there are different forest owners with a very diverse set of values. Secondly, forest owners have to realize the costs and benefits related to forest management. If the oversimplifying assumption of rational actors is ignored it can be seen that this realization of the costs and benefits can emerge through learning—either from others or through personal experience. Williamson (2000) developed four levels of social analysis where social embeddedness is on the top level and it is characterized by low frequency. If small scale forest owners' management decisions (transactions) are not frequent, institutional learning, and therefore market driven institutional change, will take more time. This is pointed out also by Schlüter (2007) who illustrates it with the example of cash vs. credit cards—every-day choices between alternatives help one to learn about the pros and cons associated with a particular alternative quicker. Forest management activities in general, especially in small-scale forests, are not frequent. Due to the relatively small size of private forests and fragmentation, many forest owners might believe that their property is not worth much (Glück et al. 2011).

The competition theory has weaknesses and a part of institutional changes cannot be explained only with this theory (Schlüter and Koch 2011). Developed mental models and ideologies tend to play a huge role in making institutional choices which again leads us to the decision-making aspects pointed out by Karppinen (1998). These ideologies, beliefs and mental models are also linked to values and as Karppinen (1998) underlines they establish the general guidelines for decision-making which are then supported by the other aspects mentioned above.

Materials and Methods

In 2007 a questionnaire survey (Estonian University of Life Sciences 2007) was carried out among forest owners and companies to obtain information about the extent of forestry activities planned, and investments made, by private forest owners in the period of 2007–2013. Also, information about support received to date and needed in the future during the new Rural Development programming period was obtained. The whole study sample in 2007 (2,064 owners with more than 10 ha and 2,113 with less than 10 ha) was taken randomly from the Forest Register, also a database of NIPF owners who had previously applied for some support measures was used ($n = 584$) (Estonian University of Life Sciences 2007). Both sources were

cross-checked for possible recurrences. Out of these 4,761 unique forest owners (i.e. 4,177 from the Forest Register and 584 from the support database) 1,000 contacts were randomly taken and these forest owners were contacted for the questionnaire survey. Out of these 1,000 forest owners 472 owners sent back their questionnaires. The final dataset for analysis consisted of 450 questionnaires; 22 questionnaires were excluded from the data analysis due to insufficient or missing answers. It is important to highlight that in the frame of this paper the data is of secondary nature but the structure of the questionnaire does not rule out the possibilities to use it for additional purposes.

Firstly forest owners were grouped by their status as members and non-members of forest associations. Responses to questions (e.g. number of holdings, the total size of the holdings, past and future silvicultural activities, preferences, expectations etc.), were statistically compared based on this grouping using Chi square tests (χ^2) and *t* tests. Relationships between variables were classed as statistically significant where the *p* value was less than 0.05. Secondly, the reasons for not joining an FOA were explored based on answers to the question "Why don't you belong to an FOA?" This was an open-ended question and open coding was used to map all the possible reasons mentioned. In the end of the coding process 6 sub-groups of reasons that emerged during the analysis were created. Results from those two steps were the basis for further discussions using the framework described in the previous sub-chapter.

Results

Of the 450 individual forest owners that formed the sample, 191 (42.4 %) were members of FOAs and 259 (57.6 %) were non-members. Differences in gender, together with some other characteristics of the two groups, are given in Table 1. On average the properties were obtained either through restitution or privatization in 1997 (members) or 1998 (non-members). In total 78 % of forest owners were males. The number of properties per owner was different among the two groups—FOA members had approximately 5 separate properties with the average total size of 63 ha while the non-members had approximately 2 separate properties with the average total size of 32 ha. The number of holdings was significantly different between the two groups of forest owners (p value < 0.05).

The answers of the two groups of NIPF owners to some general background questions were compared and the Chi square test results are presented in Table 2. More FOA members (46 %) are planning to increase the size of the forest holding than non-FOA members (32 %). Responsibility for felling operations was also related to group membership with 48 % of the members group conducting harvesting operations themselves while 69 % of non-members conducted this work themselves. Just over three-quarters of FOA members have applied for special forestry support measures while only 56 % of non-member owners have done the same.

Respondents were presented with five possible reasons for harvesting and were asked to rank the importance of each of these reasons. The importance attributed to

Table 1 General characteristics (mean values) of forest owner groups

	Member of FOA	Non-member
Gender (male/female, %)*	82/18	75/25
Age (years)*	49	53
The first forest property was obtained in (year)*	1997	1998
Number of properties owned*	4.6	2.4
Total forest area owned (ha)*	63	32
Relative income to household from forestry (2005–2006, %)	16	8

* Statistically significant difference between groups (*t* test)

two of these reasons was related to group membership (Table 3). The condition of forests (the health of the stand and the possible occurrences of bark beetle, wind throw etc.) was more important to FOA members than non-members. The importance of an efficient rotation period also differed between the two groups with 44 % of group members considering this to be very important while only 30 % of non-members considered this aspect as "very important" when making decision regarding harvesting. Overall, FOA members consider this aspect relatively more important than non-members.

The comparison of past and possible future activities revealed differences between the two groups of forest owners in activities such as forest planting, plantation maintenance, final felling, amelioration and damage prevention measures. A comprehensive overview is provided in Table 4. The data shows that during 2002–2007 FOA members were more active in forest planting (79 % of forest owners) than non-members (56 %). Similar trends were noted for plantation maintenance, final felling; damage prevention measures and amelioration. FOA members are also significantly more likely to be active in future forest management activities than non-members except in the case of undertaking damage prevention measures. FOA members have been more active in management activities and, as indicated in the future plans, will be more active as well. Yet, it is important to notice that within the non-members the relative increase in different activities was greater than within the members' group.

Open coding was used to map possible reasons for not joining FOAs (Table 5). This process identified six subgroups of reasons for not becoming FOA members. The first subgroup "lack of benefits" included responses such as "no need" to join an FOA and "no benefits" derived from joining. In the case of "lack of suitable FOA" the owners outlined that there was a "lack of FOAs" in the region or that the existing FOAs were "not appropriate" or "not acceptable" to them. In the third case "no idea" or "no information" as to what FOAs are doing or where to find one, was mentioned. Collectively these can be classed as FOA-based reasons. The other three sub-groups can be collectively classed as "forest owner individual reasons" and included reasons such as lack of enthusiasm and time, and small property size. In the case of lack of enthusiasm and time, forest owners typically used phrases such as—"don't want to", "too old", or "it's not important". In the case of property size the most common keyword was "small size". In the time related group owners said that

Table 2 Differences between the two NIPF groups' preferences, expectations and future plans

Question	Groups	Answers			χ^2	*p* value
		No (%)	Yes, to increase (%)	Yes, to decrease (%)		
Owners' plans to change the size of the holding (5-year perspective), n = 436	Members	51	46	3	9.072	*0.0107*
	Non-members	62	32	6		
		By owner him-/herself (%)	Order as a service (%)	Sale at stumpage (%)		
The ways owners conduct final felling operations, n = 395	Members	48	32	20	17.02	*0.0002*
	Non-members	69	20	11		
		Revenues > costs (%)	Revenues = costs (%)	Revenues < costs (%)		
Financial expectations towards forests, n = 425	Members	34	48	18	2.944	0.2294
	Non-members	26	54	20		
		Yes, I have applied (%)		No, I haven't applied (%)		
Financial support measures, n = 436	Members	76		24	19.14	$p < 0.005$
	Non-members	56		44		

Table 3 Basis for harvesting decisions between the two groups of owners

	Groups	Most important (%)	Very important (%)	Important (%)	Less important (%)	Not important (%)	χ^2	*p* value
Financial need (n = 367)	Members	3	8	37	33	19	3.181	0.528
	Non-members	2	11	37	27	23		
Condition of forest (n = 425)	Members	58	31	9	2	0	12.040	*0.017*
	Non-members	45	35	18	1	1		
Efficient rotation period (n = 386)	Members	16	44	30	9	1	9.824	*0.043*
	Non-members	20	30	35	10	5		
Advice (n = 367)	Members	9	18	33	22	18	5.692	0.223
	Non-members	13	16	39	15	17		
Market situation (n = 343)	Members	1	2	13	32	52	3.385	0.496
	Non-members	1	3	16	23	57		

forestry is a "side work" and that their main occupation is elsewhere; "haven't had the time to consider" was also mentioned.

Discussion

Some significant differences emerged from the comparison of the two groups. The results showed that FOA members had larger holdings and greater numbers of forest holdings (parcels) than non-FOA members. Malovrh et al. (2010) found similar trends in relation to the characteristics of owners willing to cooperate and those not willing to cooperate. The importance of the size of forest can also be seen from the fact that the 6 % of forest owners (both natural and legal persons) who are FOA members nationally (NFP 2010) own ~25 % of private forests (Erametsakeskus 2011). Furthermore, the analysis revealed that 13 % of non-members stated that they do not belong to FOAs due to the small size of their holding (on average 12 ha). The significance of holding size might be linked to how frequent management activities are conducted because usually the larger forest area means more diverse forest stands in Estonia, which means more opportunities and possibilities to conduct some forest management activities. This does not mean that the small forest owners do not manage their holdings at all—they indeed might but the possible additional benefit of being an FOA member is not significant for some of them. As highlighted, fragmentation (separate holdings) is an important factor as well. Although linked somewhat with the total size, it can be argued that in cases of fragmentation and small properties cooperation might lead to minimized transaction costs, which could be one of the reasons for joining an FOA as also outlined by

Table 4 Forest management activities conducted during the past 5 years (2002–2007) and future plans (2007–2014), n = 450

Activity	Group	Done in the past (%)	*p* value	Will do in the future (%)	*p* value
Forest planting	Members	79	*<0.005*	84	*<0.005*
	Non-members	56		66	
Plantation maintenance	Members	66	*0.0073*	78	*0.0016*
	Non-members	53		64	
Precommercial thinning	Members	63	0.1897	77	0.1296
	Non-members	57		71	
Commercial thinning	Members	61	0.3058	69	0.5563
	Non-members	56		66	
Sanitary harvesting	Members	74	0.1716	71	0.2804
	Non-members	68		76	
Final felling	Members	68	*0.0078*	62	*0.0028*
	Non-members	55		47	
Damage prevention measures	Members	19	*0.011*	27	0.0509
	Non-members	10		19	
Restoration of damaged forest	Members	19	0.1902	26	0.7352
	Non-members	14		24	
Amelioration	Members	19	*0.0452*	41	*0.0223*
	Non-members	11		31	
Constructing fire bars for protection	Members	0	0.6169	4	0.715
	Non-members	1		3	
Constructing fire hydrants	Members	5	0.7908	15	0.1053
	Non-members	4		9	

Schlüter (2007). In addition, during 2005–2006 the relative income from forestry to the household was twice as high in the members' group compared to non-members. Therefore, for smaller forest owners it might take more time to recognize the benefits of being an FOA member. In terms of harvesting no differences were found in thinning, yet members seem to be more active in final felling and probably due to that also in planting and plantation maintenance. The differences in management e.g. harvesting suggest that ownership objectives could be very different as well between the two groups as concluded by Favada et al. (2009). Our results suggest that forest owners who belong to FOA tend to use more contractors or sell harvesting rights than non-FOA members. Non-members on the other hand tend to use their own labour for final felling. Also, members consider the condition of the forest (damage) and forest maturity slightly more important than non-members. In fact, forest maturity could be seen as the minimum age for a stand for final felling. All these points suggest that FOA members tend to value the economic benefits of forest management more than non-members. The difference in the values owners place on various types of forest benefits is also outlined by Berlin et al. (2006) and Rickenbach et al. (2006). FOAs serve a particular type of owner—one

Table 5 Reasons for not being a FOA member (n = 450)

FOA members (42 %)	Already have a plan to join FOA (1 %)	No plan to join (57 %)
FOA based reasons (30 %)		Lack of benefits (18 %) Lack of suitable FOA (6 %) Lack of information (6 %)
Forest owner individual reasons (24 %)		Lack of enthusiasm (10 %) Small property size (8 %) Lack of time (6 %)
Other reasons (3 %)		

who is interested in gaining more income from their holdings (Berlin et al. 2006). The results from the study seem to agree with this. The importance of economic benefits is also outlined in a study by Nonic et al. (2011) where the most important precondition to join an FOA is that it should have some economic advantage for members. It seems that management activities and the size of forests are correlated—non-members, as somewhat smaller forest owners, indicated a larger interest in sanitary harvesting and the importance of own labour. In such cases the reason could be that the main ownership objective is wood for self-consumption and the economic value of forests is not emphasized.

Karppinen (1998) outlined that values together with situational (e.g. market) and institutional (e.g. legislation) aspects form the guidelines for behaviour. Membership of an FOA helps to voice the needs of forest owners in the policy arena (Rickenbach et al. 2006), helps to protect their ownership rights (Kittredge 2005) and might lead to more efficient management (Schlüter 2007), but the core of the decisions tend to lie on the values, or to be more precise, on how forest owners perceive the different values forests provide. For some countries with a longer history of private forest ownership, the values and expectations towards forests are different compared to the ex-Soviet countries. For example, Rickenbach et al. (2006) found that the biggest differences in perceived benefits between FOA members and non-FOA members are ecological (landscape values, habitats, healthy and diverse forests) with non-FOA members valuing the ecological benefits more but there was no statistical difference between groups in perceived economic benefits. At the same time they found that members tend to be more active in management activities (recreation, thinning, restoration, invasive species control) with one important exception—timber harvesting. Cooperation between forest owners, at least in the Estonian case, is seen as a tool for increasing timber harvesting in private forests. This is indicated directly in the NFP 2011–2020 (2010) as a policy goal but the results of this study also indicate the importance of other benefits.

In addition to the discussion above, it is of utmost importance to mention another aspect related to cooperation. As the results of this analysis have shown, cooperation does not universally appeal to all owners (Kittredge 2005). Nonic et al. (2011) showed that in the case of Serbia, 39 % of forest owners in their study were not

prepared to engage themselves in the establishment of a FOA. Similar results can be seen also in the US where approximately 25 % of forest owners were classified as "non-cooperator" (Finley et al. 2006). Since FOAs are not based on compulsory membership they usually reflect certain types of forest owners and should aim at meeting the expectations of more forest owners (Berlin et al. 2006). In this case 1/3 of the non-member owners indicated that the reason for not being a member is that there is no need for or no benefits linked to being a member of an FOA. Yet, the general characteristics of this group were quite similar to those of FOA members. It could be that owners in this group have just not recognized the benefits of being a member, but they could potentially become members at one point. Also, the different reasons for not being a member in an FOA indicate that there might be two broad key aspects—the above-mentioned "institutional learning" which is linked to the frequency of forest management activities and different value perceptions among forest owners. In terms of learning the relative increase in management activities in the future within the non-members' group might indicate that at least some forest owners might eventually become FOA members if they recognize the benefits. As Rickenbach et al. (2006) highlight, the diverse objectives and interests of forest owners put FOAs in a difficult position—it is complicated to satisfy a huge variety of demands. Therefore, there are limitations to voluntary cooperation and the potential rate of cooperation evolves together with the developments in privatization, with the evolution of existing FOAs and the changing private forest ownership.

As highlighted earlier only 6 % of forest owners are currently engaged in FOAs according to the NFP 2011–2020 (2010:26). The proportion of respondents who were FOA members in the study sample (42 %) is much higher than the national figure. This might be due to the fact that one part of the initial target group included forest owners who had applied for some support measures and FOA members might be more active in applying for such supports. Secondly, FOA members tend to be more active and might therefore be more inclined to respond to such surveys.

Conclusions

The restitution and privatization processes have significantly changed the forestry sector in Estonia. More and more emphasis is being put on forest owners' cooperation by policy-makers. Organized non-industrial private forest owners are seen by the state as a tool to overcome the problems linked with the fragmentation of forest holdings. Schraml (2005) outlined that FOAs are potentially efficient policy instruments for solving these problems in small-scale forestry. Although FOAs had already emerged in Estonia in the early 1990s, the rate of cooperation has been relatively low. As cooperation is seen as an effective measure to increase wood mobilization (Schlüter 2007) and provide knowledge transfer among forest owners, it is important to understand the differences between FOA members and non-members and to determine whether these differences could be explained by using some general themes about decision-making and cooperation.

The first key aspect was fragmentation (number of holdings) and the size of forest holdings—FOA members have on average more holdings and their average total

forest area is larger in size compared to non-members. FOA members have been more active in management activities and, as indicated in the future plans, will be more active as well. Yet, it is important to notice that within the non-members the relative increase in different activities was greater than within the members' group. It shows that FOA members are steadier in their practices. The higher relative increase compared to the past and planned future activities in the non-members' group might also indicate that at least some of them might become members of an FOA. This might be due to the increased frequencies in management activities as indicated by Schlüter (2007) and Williamson (2000). Their institutional learning might lead to the understanding of how membership in an FOA might be beneficial in taking these different activities into consideration. As Karppinen (1998) distinguished, the decisions of forest owners are in general based on situational and institutional aspects which, put in FOA context, means improved market access or conditions and a greater voice in policy making (Rickenbach et al. 2006). Yet the most important factors are the long term objectives and values of owners (Karppinen 1998). Since FOAs serve a particular type of owner—one who is interested in gaining more income from his/her holding (Berlin et al. 2006), there are greater limits to cooperation. A FOA with relatively one-sided activities limits itself in terms of membership and capacity and might not be successful. Although cooperation might not be acceptable for everyone there is still a huge potential in the Estonian case since only 6 % of forest owners have engaged themselves in FOAs (NFP 2010). In addition, the results indicate that there is a remarkable number of forest owners either with a lack of information about FOAs or a lack of knowledge about forest management in general. Forest policy should put more emphasis on capacity (advisory and extension services) and incentive tools (for both tangible and intangible goods) to guide private forestry. Since cooperation is linked to many aspects (rate of privatization, FOA developments, structural changes within private forest ownership) it can be argued that cooperation is in fact a "moving target" and needs to be understood in the frame of forest owners' values, their objectives and economics. For policy-makers, this poses additional difficulties in guiding forest policy implementation.

Although the provided analysis is based on secondary data, it gives a valuable insight into cooperation between forest owners in Estonia. In addition, it helps to guide future research in this area and it could be a basis for analysing the situation nowadays since the data analysed was from 2007. In addition, forest owners with very small properties could be additionally studied taking into account their different position towards forest management compared to larger owners whose management activities are more frequent. The findings could help policy-makers to guide the implementation of the Estonian NFP until 2020. Additionally, it can be concluded:

- FOA members tend to be more interested in forest management—on average they have more forested land, they are more active in the management—which suggests that institutional learning might play a very important role in making decisions to join an FOA.

- It seems that forest owners value FOA membership mainly for economic reasons (market access, minimized transaction costs).
- FOAs should diversify their activities more in order to satisfy a wider range of forest owners with different values, needs and properties. This is important not only because there is a possibility to increase timber utilization, but also to increase the provision of other benefits (e.g. biodiversity, recreation) that are gaining more and more importance.
- There is a need to study the needs and values of non-industrial private forest owners in Estonia to successfully guide forest policy implementation.

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